

CLAIMS

What we claim as new is:

1. A non-asphaltic underlayment comprising a substrate in which at least one surface thereof comprises a breathable thermoplastic film selected from the group consisting of a polyurethane based thermoplastic film, an ethylene-methacrylate or ethylene acrylic acid based thermoplastic film, a micro-porous polyolefinic thermoplastic film, a micro-porous polyester thermoplastic film and combinations or multilayers thereof, said breathable thermoplastic film imparts water-resistance to the substrate while maintaining breathability thereof.
2. The non-asphaltic underlayment of Claim 1 wherein the breathable thermoplastic film is located on one surface of the substrate.
3. The non-asphaltic underlayment of Claim 1 wherein the breathable thermoplastic film is located on both surfaces of the substrate.
4. The non-asphaltic underlayment of Claim 1 wherein the substrate is a woven or non-woven reinforcement thermoplastic polymeric material, an inorganic felt material, or an organic felt material.
5. The non-asphaltic underlayment of Claim 4 wherein the substrate is a non-woven substrate.
6. The non-asphaltic underlayment of Claim 1 wherein the substrate is a thermoplastic polymeric material selected from the group consisting of a polyolefin, polyethylene terephthalate, a polyamide, a polyvinyl chloride, a polystyrene, a polyacrylic and copolymers thereof.

7. The non-asphaltic underlayment of Claim 6 wherein the substrate comprises polyethylene, polypropylene or polyethylene terephthalate.
8. The non-asphaltic underlayment of Claim 1 wherein the substrate comprises a cellulose fiber mat or a glass fiber mat.
9. The non-asphaltic underlayment of Claim 1 wherein the substrate has a thickness from about 5 to about 60 mils.
10. The non-asphaltic underlayment of Claim 1 wherein the breathable thermoplastic film is a polyurethane based thermoplastic.
11. The non-asphaltic underlayment of Claim 1 wherein the breathable thermoplastic film is an ethylene-methacrylate copolymer based thermoplastic.
12. The non-asphaltic underlayment of Claim 1 wherein the breathable thermoplastic film has a thickness from about 0.5 to about 10 mils.
13. The non-asphaltic underlayment of Claim 1 further comprising a tie layer located between the substrate and the breathable thermoplastic film.
14. The non-asphaltic underlayment of Claim 13 wherein the tie layer is selected from the group consisting of a polyamide, an ethylene copolymer, wood rosin and its derivatives, a hydrocarbon resin, a polyterpene resin, atactic polypropylene and amorphous polypropylene.
15. The non-asphaltic underlayment of Claim 13 wherein the tie layer is ethyl methyl acrylate (EMA) having a methyl acrylate level of about 18 % or greater.

16. The non-asphaltic underlayment of Claim 1 further comprising a water repellent material, an algaecide, an herbicide, an antifungal material, a surface friction agent, a flame retardant, or a coloring dye.
17. The non-asphaltic underlayment of claim 1 wherein the underlayment is a base sheet of a peel and stick roofing product.
18. A non-asphaltic underlayment comprising a substantially non-water-resistant polypropylene substrate in which at least a top surface thereof comprises a polyurethane based thermoplastic film disposed thereon, said polyurethane based thermoplastic film imparts water-resistance to the substrate while maintaining breathability of the substrate.
19. A method of manufacturing a non-asphaltic underlayment comprising applying a breathable thermoplastic film selected from the group consisting of a polyurethane based thermoplastic film, an ethylene-methacrylate or ethylene acrylic acid based thermoplastic film, a micro-porous polyolefinic thermoplastic film, a micro-porous polyester thermoplastic film and combinations or multilayers thereof to at least one surface layer of a substrate, said breathable thermoplastic film imparts water-resistance to the substrate while maintaining the breathability of the substrate.
20. The method of Claim 19 wherein the applying includes die extrusion, air spraying, dip coating, knife coating, roll coating or a film application.
21. The method of Claim 19 wherein the applying comprises lamination.
22. The method of Claim 19 wherein the applying comprises chemical bonding, mechanical bonding, thermal bonding or any combination thereof.
23. A roofing system comprising a non-asphaltic, breathable underlayment and one or more shingles laid-up on an uppermost layer of the underlayment, said underlayment

comprising a woven or non-woven substrate in which at least one surface thereof comprises a breathable thermoplastic film selected from the group consisting of a polyurethane based thermoplastic film, an ethylene-methacrylate or ethylene acrylic acid based thermoplastic film, a micro-porous polyolefinic thermoplastic film, a micro-porous polyester thermoplastic film and combinations or multilayers thereof disposed thereon, said breathable thermoplastic film imparts water-resistance to the substrate without negatively impacting breathability of the substrate.

24. A roofing system comprising a non-asphaltic, breathable underlayment and one or more shingles laid-up on an uppermost layer of the underlayment, said underlayment comprising a woven or non-woven substrate in which at least one surface thereof comprises a polyurethane based thermoplastic film, disposed thereon, said polyurethane thermoplastic film imparts water-resistance to the substrate while maintaining breathability as defined in ASTM E96 standard.

25. The roofing system of Claim 24 wherein the one or more shingles include asphalt-containing single or multi-ply shingles.

26. A breathable and yet water-resistant coating selected from the group consisting of a polyurethane based thermoplastic film, an ethylene-methacrylate or ethylene acrylic acid based thermoplastic film, a micro-porous polyolefinic thermoplastic film, a micro-porous polyester thermoplastic film and combinations or multilayers thereof over a woven or a non-woven substrate.

27. The breathable and yet water-resistant coating of Claim 26 wherein said underlayment forms a seal around any penetrations.

28. The breathable and yet water-resistant coating of Claim 27 wherein said penetrations are the result of securing means.

29. The breathable and yet water-resistant coating of Claim 28 wherein said securing means comprise nails, staples or combinations thereof.